Science Toolkit: Grade 7 Objective 3.B.2.b

Student Handout: Science: Grade 7 Objective 3.B.2.b

Standard 3.0 Life Science

Topic B. Cells

Indicator 2. Recognize and provide examples that human beings, like other organisms have complex body systems of cells, tissues and organs that interact to support an organism's growth and survival.

Objective b. Select several body systems and explain the role of cells, tissues and organs that effectively carry out a vital function for the organism, such as

- Obtaining food and providing energy (digestive, circulatory, respiratory)
- Defense (nervous, endocrine, circulatory, muscular, skeletal, immune)
- Reproduction (reproductive, endocrine, circulatory)
- Waste removal (excretory, respiratory, circulatory)
- Breathing (respiratory, circulatory)

Selected Response (SR) Item

Question

Use the technical passage below to answer the following:

A Natural Snake-Bite Antidote?

Snake bites and bee stings can be either painful or downright deadly, depending on which species is doing the biting, and sometimes whether the person being bitten is allergic to the venom.

New research in mice suggests that these bites and stings would be even more dangerous if not for a special defensive trick that the mouse's immune system can pull off.

Dr. Stephen Galli of Stanford University and his colleagues studied mast cells, which are immune cells that contribute to the inflammation that's part of asthma, allergies and even the extreme, anaphylactic shock[1] that can happen to some people with severe allergies to things like peanuts.

In these cases, the immune system gets mixed up and thinks it's being attacked by something harmful. But, mast cells also do beneficial things in the body. The scientists discovered that the cells also play a helpful role against certain snake and honeybee venoms. In their study they showed that the cells protected mice, making the venom's effects less harmful.

The cells released an enzyme[2] that broke down dangerous components of the venom of a snake called the Israeli mole viper. Dr. Galli said that it might someday be possible to make better snake bite or bee sting treatments that are based on this type of enzyme. More research will be necessary to see if this is possible.

Dr. Galli thinks that this feature of the mast-cell defense system may have evolved, in animals that are prey to snakes or get stung by bees, partly as a way to help to protect against venom. This defense isn't foolproof or perfect, but it gives the prey animals a better chance of survival, especially if they get less than a "full dose" of venom in the bite of a poisonous snake.

[1]anaphylactic shock – a severe allergic reaction that occurs rapidly and causes a life-threatening response involving the whole body

[2]enzyme – a protein in the body that helps control a chemical reaction

The mast cells of the human body are responsible for

A. defense
B. reproduction
C. removing waste
D. providing energy

Correct Answer

A. defense

Question

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